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EXHAUST VALVE OF A COMPRESSOR

[Auslassventil eines Kompressors]

[Not listed]

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Inventor : [Not listed]
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The technical innovation involves an exhaust valve of a compressor, in particular for a compressed air brake device for vehicles, with a valve plate covering a valve seat which during the opening stroke raises from its valve seat against the force of a valve spring resting on it and with a catch whose catch interior area serves as a counter bearing for the valve spring.

With such exhaust valves there often appear disturbing valve /2 noises. In addition, they often do not open easy enough.

The innovation has the goal of dampening valve noises, in that the impact energy of the valve plate is distributed on its seat over a longer time period. In addition, the valve should open more easily, in order to enable it to be effective even with low flow-through quantities like those appearing with a lower revolution speed of a compressor. As a result, the required quantity should be increased at a low revolution speed.

This goal is solved in the innovation by the catch internal area and the area of the valve seat being inclined at a slight angle to each other.

¹ Numbers in the margin indicate pagination in the foreign text.

An execution model of the innovation is depicted in the drawings; shown are:

Figure 1: Cut-away view of the exhaust valve in the closed position,

Figure 2: Overhead view of the exhaust valve,

Figure 3: Half-open exhaust valve, and

Figure 4: Completely opened exhaust valve.

The exhaust valve of a compressor, which is not depicted, has a valve seat 1 over which a valve plate 2 is positioned as a closing body for the seat. The valve plate 2 is subjected to the force of a valve spring 3 which tries to hold the valve plate 2 on its valve seat 1.

A catch 4 whose interior area 4 serves as a counter bearing for the valve spring 3 lies across the valve seat 1 and the valve plate 2. The catch has four feet 8 with which it holds itself at a distance from the valve seat 1 and which serve as an exterior guide for the valve plate 2.

The valve plate 2 generally lies on an area 6 of the valve /3 seat 1. The interior area 5 of the catch 4 and the area 6 of the valve seat 1 are inclined with respect to each other at a slight

angle. In the process the area 6 of the valve seat 1 is positioned vertically to the axis 7 of exhaust valve and the interior area 5 of the catch 4 is inclined to the axis 7 of the exhaust valve.

As can be seen in Figure 1, by this design of the catch 4 the valve spring 3 is tensioned more on one side (left) than the other side (right). As a result, the valve plate 2 makes a flap-like movement during its opening and closing stroke with the pivot point on the side of the greater tension of the valve spring 3. The stroke of the valve plate 2 is greater on one side (right) than the other side (left). In the process the spot with the smallest stroke of the valve plate 2 is appropriately positioned at a location 9 at which no air outflow occurs. This location 9 in the exhaust valve is opposite one of the four feet 8 of the catch 4 which serve to axially guide the valve plate 2 (Figure 2).

The pressure build-up in front of the exhaust valves first raises the valve plate 2 from its valve seat 1 on the side with the smaller spring tension, i.e., the valve opens only at one location on the seat circumference. The opening occurs easily and even occurs at a low revolution speed of the compressor. As

a result, the required quantity for the compressor is increased even at a low revolution speed (Figure 3). The valve plate 2 is only completely raised from its seat 1 with full pressure impact (Figure 4).

When the exhaust valve is closed, only then does the side of the valve plate 2 rest on the valve seat 1 which performed the smaller stroke. Only with a continuing pressure build-up does the side with the larger stroke reach its position on the valve seat 1. The acceleration energy of the valve plate 2 is distributed over a greater period of time, so that closing forces at the moment are relatively small. As a result, the /4 closing process thereby does not occur abruptly but instead with very little noise.

The interior area 5 of the catch inclined to the valve seat area 6 can also be constructed by means of a special wedge piece or a hump on the catch interior area.

Claims /5

1. Exhaust valve of a compressor, in particular for a compressed air brake device for vehicles, with a valve plate covering a valve seat which during the opening stroke

raises from its valve seat against the force of a valve spring resting on it and with a catch whose catch interior area serves as a counter bearing for the valve spring, thereby characterized by the catch interior area (5) and the area (6) of the valve seat (1) being inclined to each other at a slightly inclined angle (α).

2. Exhaust valve according to Claim 1, thereby characterized by the area (6) of the valve seat (1) being positioned vertical to the axis (7) of the valve and by the interior area (5) of the catch (4) being inclined to the axis (7) of the valve.
3. Exhaust valve according to Claim 1 or 2, thereby characterized by the position with the smallest stroke of the valve plate (2) occurring at a location (9) at which no air outflow occurs.
4. Exhaust valve according to Claim 3, thereby characterized by the location (9) lying opposite a foot (8) of the catch (4).

/6

Figure 1

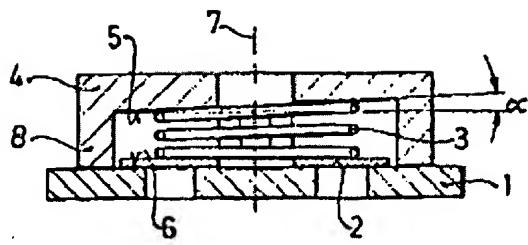


Figure 2

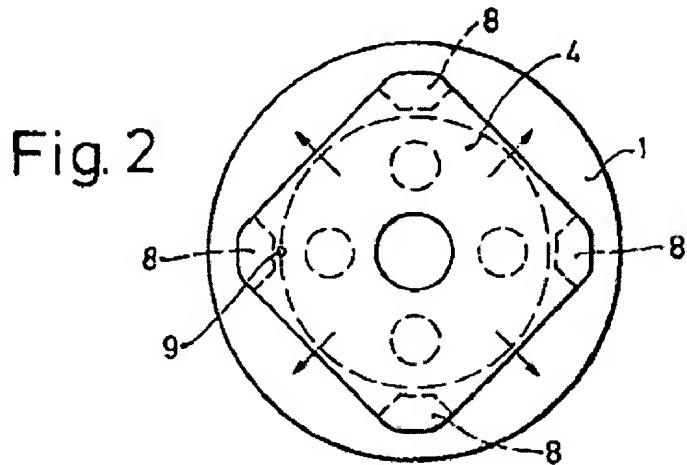


Fig. 2

Figure 3

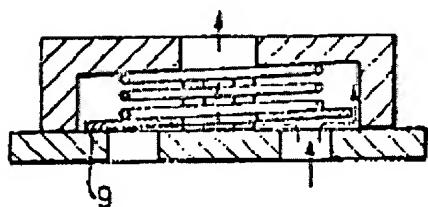


Figure 4

